

**Research Article**

## **AN INVENTORY AND ASSESSMENT OF SNAKE DIVERSITY OF GANDHAMARDAN HILLS RANGE OF WESTERN ORISSA, INDIA**

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### **ABSTRACT**

Gandhamardan Hills Range (GHR) of western part of Orissa, rich in biodiversity was investigated thoroughly to prepare an inventory of snake diversity in this paper. During the monsoon and post monsoon of 2012 and 2013, a checklist of the snake diversity of this area was prepared with the help of local snake catchers and fishermen. An inventory of the species encountered is presented in the present paper with their scientific names, vernacular names and local names with the help of referred literature. The microhabitats of the snakes are assessed on the basis of their diurnal and nocturnal habits. The snakes are 20 species belonging to 17 genera and 5 families. The family colubridae dominates the other four families. Due to anthropogenic pressures the number of these animals is decreasing very sharply. Our primary duty is to give protection to these animals *in situ* and conserve them for our posterity to cherish.

**Keywords:** Snake diversity, Gandhamardan Hills Range, Anthropogenic pressures, *In situ* conservation.

### **INTRODUCTION**

The snakes are integral part of a forest ecosystem as their position in the food chain as predators making them important in the nutrient flow. They play 'Key ecological roles' in controlling rodent pests (Fitch, 1949 and Gibbons, 1988). They maintain the balance of nature and serve a lot to mankind. Depletion of these animals throughout the globe and their extinction is causing a conscientious and diligent task to the people of all spheres of the society to conserve them (Sahu *et al.*, 2014). Their populations are influenced by microhabitat factors such as soil, pH, humidity, leaf litter and woody debris (Faccio, 2001). The global declines of some snakes along with other reptiles (Gibbons *et al.*, 2000) need to establish long term programmes to track population trends of these species and to correct these trends (Fitch, 1949). Among reptiles, snakes are top predators and therefore a decline in their numbers may have serious consequences for the functioning of

many ecosystems (Reading *et al.*, 2010). But unfortunately due to anthropogenic pressures, these are depleting very sharply from the earth (Sahu *et al.*, 2014).

In most of the parts of the earth, herpetologists are trying to provide the actual assessment of these animals. In India also the work was done accurately and many new species were discovered by them. Many herpetologists in Orissa and Chhattisgarh also did some assessment of the snake fauna in an excellent way (Dasgupta, 1990; Sanyal and Dasgupta, 1990; Sanyal, 1993; Chandra and Gajbe, 2005). Some areas of Orissa are still remained uncovered in this field and many species of snakes are becoming extinct before they come to human knowledge. A wildlife study was performed in the Gandhamardan Hills Range of Western Orissa (Pradhan, 1987). But it was a preliminary step to assess the vertebrate fauna of GHR. The work was carried out an extensive investigation of herpetofauna diversity of GHR

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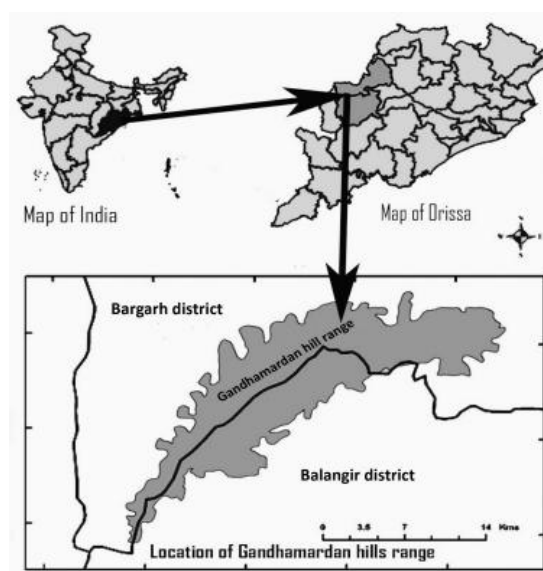
during the monsoon and post monsoon of 2012 and 2013 from which a checklist of snake fauna of GHR is prepared which will provide information to the posterity.

## MATERIALS AND METHODS

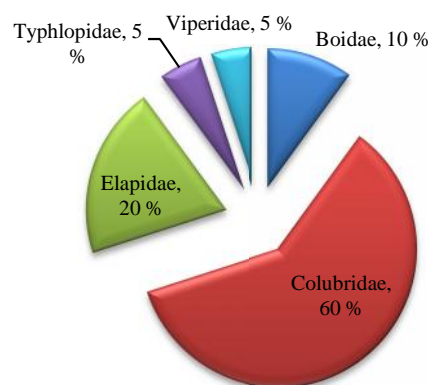
The study area (Gandhamardan Hills Range or GHR) lies between 20°42'-21°00' North latitude and 82°41'-83°05' east longitude is classified as a reserve forest with an area of 251 km<sup>2</sup> (Mishra, 2004) which is a part of Eastern Ghats of India (Sahu *et al.*, 2010). This hills range forms a natural boundary on the North Western side Bolangir district and the southern boundary of Bargarh district of Orissa. The richness of GHR is due to its' water resources with 840 springs perennial in nature, which feed water into 54 small streams and 14 larger streams joining two rivers the Ong and the Suktel. These two rivers join the Mahanadi of Orissa (Pradhan, 1987). This forest ecosystem is rich in Biodiversity (Bhadra and Dhal, 2010). Investigators designing or implementing visual surveys of known or new den sites must incorporate mechanisms to account for bias among observes with different search images, abilities to concentrate, experience or knowledge of the target species (Rodda, 1993).

Snakes are most active during monsoon and post monsoon. Hence, the months from July to November of 2012 and 2013 were selected as the period of study timing. This period represents the active period of the snake fauna. The time of visit was well suited for snake activity. The snakes are both diurnal, nocturnal and some are crepuscular. So that the survey was conducted at day, evening and night time. The visual encounter survey (VES) technique was used. The VES technique involves walking through the study site systematically searching for snakes. No time constrained studies (TCS) were utilised and hence a varied amount of time was utilised at the sites based on species diversity. Periodical searches under rocks and debris were carried out ensuring that microhabitats were not disturbed. Multiple sampling technique (MST) was used which is broadly divided into two categories i.e. direct and indirect sampling methods (Dar *et al.*, 2008, Pal *et al.*, 2012; Sahu *et al.*, 2014). Identification of snakes was performed capturing

the animals by hand using the gloves and hooks and then these were photographed. All the specimens were released in the same microhabitats where these were captured. The photographs were matched with referred literatures and identified properly (Daniel, 2002; Das, 2002; Whitaker, 2006; Whitaker and Captain, 2008; Dutta *et al.*, 2009). The equipments used for survey work were the hand gloves, hooks, torches for night searches, measuring tape, Nikon-L 810 (24X zoom camera) and a Nikon coolpix-2500 camera for photography. All animals after diagnosis and photographed were released into their habitats *in situ*.



**Figure 1.** Gandhamardan hills range of Western Orissa.



**Figure 2.** % of families of snakes of GHR out of 20 species.

## RESULTS AND DISCUSSION

From the survey and assessment work in different parts of the forest areas of GHR, it was found that the snakes available are 20 species belonging to 17 genera and 5 families (Table 1). The local names, vernacular names and scientific names are given in Table 1 along with their IUCN status. During this survey their microhabitats are also investigated where these are available (Table 2). The habits of these species are also given in Table 2. From all the 5 families, Colubridae predominates other 4

families, 2 species belong to Boidae family, 12 species to Colubridae, 4 species to family Elapidae and one each species to Typhlopidae and Viperidae. The percentage of all the five families is mentioned in Figure 2.

Local people were found to kill both the venomous and non-venomous snakes due to lack of knowledge and fear of being bitten (Chetty, 2010). Some tribes of GHR use different snakes as traditional medicines as seen in other parts of India (Jamir and Lal, 2005, Negi *et al.*, 2007; Padmanabhan and Sujana, 2008).

**Table 1.** Inventory of Snake Fauna of Gandhamardan Hills Range (These snakes belong to 5 families 17 genera and 20 species).

Family	Scientific Name	Common Name	Local Name	Status
Boidae	<i>Gongylophis conicus</i> (Schneider, 1801)	Common Sand Boa.	Phutka Sap	NV/LC
Boidae	<i>Python Molurus</i> (Linnaeus, 1758)	Indian Rock Python	Ajgar Sap	NV/LC
Colubridae	<i>Ahetula nasuta</i> (Lacepede, 1789)	Common Vine Snake	Dal Kalet	MV/LC
Colubridae	<i>Amphisema stolatum</i> (Linnaeus, 1758)	Stiped Keel Back	Bamni Sap	NV/LC
Colubridae	<i>Argyrogena fasciolata</i> (Shaw, 1802)	Banded Racer		NV/R
Colubridae	<i>Boiga trigonata</i> (Schneider, 1802)	Common Cat Snake	Pahadia Chiti	MV/LC
Colubridae	<i>Boiga forsteni</i> (Dumeril & Bibron, 1854)	Forsten's Cat Snake	Katkatia Naga	MV/LC
Colubridae	<i>Chrysopelea ornata</i> (Shaw, 1802)	Ornate flying snake	Udanta Sap	MV/LC
Colubridae	<i>Dendrelaphis tristis</i> (Daudin, 1803)	Common Indian Bronze-Back Snake.	Kauchia	NV/LC
Colubridae	<i>Macropisthodon plumbicolor</i> (Cantor, 1836)	Indian Green Keel Back	Sabuja Dhanda	NV/LC
Colubridae	<i>Oligodon arnesis</i> (Shaw, 1802)	Common Kukri Snake	Mati Hara Sap	NV/LC
Colubridae	<i>Lycodon aulicus</i> (Linnaeus, 1758)	Common Wolf Snake	Kaudia Chiti	NV/LC
Colubridae	<i>Ptyas mucosus</i> (Linnaeus, 1758)	Common Rat Snake	Dhamana	NV/LC
Colubridae	<i>Xenochrophis piscator</i> (Schneider, 1799)	Checkered Keel Back	Pani Dhanda Sap	NV/LC
Elapidae	<i>Bungarus caeruleus</i> (Schneider, 1801)	Common Krait	Chiti Sap	V/LC
Elapidae	<i>Bungarus fasciatus</i> (Schneider, 1801)	Banded Krait	Rana Sap	V/LC
Elapidae	<i>Naja naja</i> (Linnaeus, 1758)	Binocelate Cobra	Nag Sap	V/LC
Elapidae	<i>Naja kaouthia</i> (Lesson, 1831)	Monocelate Cobra	Tampa Sap	V/LC
Typhlopidae	<i>Ramphotyplops braminus</i> (Daudin, 1803)	Common Worm Snake	Teli Sap	NV/R
Viperidae	<i>Daboia russelii</i> (Shaw & Nodder, 1797)	Russel Viper	Chandra Boda	V/LC

V=Venomous, NV=Non-Venomous, MV=Mildly-Venomous, LC=Least Concern, R=Rare.

**Table 2.** Assessment of the microhabitats in which snakes are available and about their Oviparity or Viviparity.

Sl. No.	Name of the Species	Microhabitat in which it is present
01	<i>Gongylophis conicus</i>	N/C/F/T , SC/HH and V.
02	<i>Python molurus</i>	N/A/T , SC/DF/GL and O.
03	<i>Ahetulla nasuta</i>	D/A/T , SC/DF/GL and V.
04	<i>Amphisema stolatum</i>	D/T, HH/SC/DF and O.
05	<i>Argyrogena fasciolata</i>	D/T/aq/A, HH/SC/DF and O.
06	<i>Boiga trigonata</i>	N/T , HH/SC/DF and O.
07	<i>Boiga forsteni</i>	N/T, HH/SC/DF and O.
08	<i>Chrysopelea ornata</i>	D/A, HH/SC/DF and O.
09	<i>Macropisthodon plumbicolor</i>	N/C/T/AG/F, HH/GL/SC/DF and O.
10	<i>Dendrelaphis tristis</i>	D/A/T, SC/DF and O.
11	<i>Lycodon aulicus</i>	N/A/T, HH/SC/DF and O.
12	<i>Oligodon arnesis</i>	N/T, HH/SC/DF and O.
13	<i>Ptyas mucosus</i>	D/T/A, HH/AG/SC/DF and O.
14	<i>Xenochrophis piscator</i>	D/N/aq/AQ, HH/DF and O.
15	<i>Bungarus caeruleus</i>	N/aq/T, HH/AG/SC/DF and O.
16	<i>Bungarus fasciatus</i>	N/T , HH/SC/DF and O.
17	<i>Naja naja</i>	D/T, HH/SC/DF and O.
18	<i>Naja kaouthia</i>	D/C/aq/T/F , HH/SC/DF and O.
19	<i>Ramphotyplops braminus</i>	C/T/F/aq, HH/SC/DF and O.
20	<i>Daboia russelii</i>	N/C/F, HH/SC/DF and O.

The habitats of these animals are classified into four types such as, HH = Human Habitation, AG = Agricultural Fields, GL=Grass Land, SC = Scrub Forest, and DF= Deep forest. The scrub forest includes the areas where small bushes grow densely. **Adaptive types:** N=Nocturnal D=Diurnal, C=Crepuscular, A = Arboreal, T = Terrestrial, AQ = Aquatic, aq = semi aquatic, F= Fossorial. O=Oviparous, V=Viviparous.

## CONCLUSION

Due to forest degradation and deforestation by the local residents nearby GHR, snake population decrease because of habitat loss. Philip Bowels, Coordinator of IUCN's Snake and Lizard Red List Authority said the findings sounded alarm bells on the state of reptiles. The spread of farming and deforestation in GHR represents two most important anthropogenic pressures causing depletion of these valuable fauna. So, these are the causes which will deplete not only snake population but also affect the entire biodiversity of GHR.

## CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interests associated with this article.

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